

REMARKS

The Examiner has rejected Claims 1-4, 6-7, 9-12, 16-18, and 20 under 35 U.S.C. 103(a) as being unpatentable over Gallo et al. (U.S. Patent No. 6,907,469), in view of Hawthorne III et al. (U.S. Publication No. 2003/0152075). Applicant respectfully disagrees with such rejection, especially in view of the amendments made hereinabove to independent Claim 1.

With respect to independent Claim 1, the Examiner has relied on Figure 4; and Paragraphs 0052, 0054, and 0056 from Hawthorne III to make a prior art showing of applicant's claimed "second controller [which] configures the second lookup table for the first type lookup."

Applicant respectfully asserts that the excerpts relied upon by the Examiner merely teach that "FIG. 4...[shows] the functional elements within the L2 processor 428 [which] include an L2 forwarding engine 432 and a hardware-based L2 forwarding table 434" and that "[t]he functional elements within the control module 424 include an L2 learning engine 436, VLAN ID translation rules 438, and a software-based L2 forwarding table 440" (Paragraph 0052). Additionally, the excerpts teach that "[t]he hardware-based L2 table 434 contains an ordered data structure of table entries" where "[t]he table entries include forwarding information that is used to forward traffic through the network node" (Paragraph 0054). Furthermore, the excerpts teach that "[t]he software-based L2 forwarding table 438 that is maintained within the control module 424 includes a database structure of table entries that is stored in software" (Paragraph 0056 - emphasis added).

However, the excerpts fail to teach that "the second controller configures the second lookup table for the first type lookup" (emphasis added), as claimed by applicant. Clearly, simply disclosing that "[t]he software-based L2 forwarding table 438...is maintained within the control module 424" in conjunction with "a hardware-based L2 forwarding table 434" which "contains an ordered data structure of table entries," as in

Hawthorne III, fails to even suggest that “the second controller configures the second lookup table for the first type lookup” (emphasis added), as claimed by applicant.

With respect to independent Claims 9 and 18, the Examiner has relied on the following excerpts from Hawthorne III to make a prior art showing of applicant’s claimed technique “when in the second mode...splitting the first type lookup into a first level and a second level;...using the second lookup table for the first level; and...using the first lookup table for the second level” (as amended - see this or similar, but not necessarily identical language in the foregoing independent claims).

“With regard to VLAN traffic, the L2 forwarding engine 432 uses the input VLAN ID of the traffic to determine the respective output VLAN ID and output port for the traffic. If the VLAN ID translation rule for the respective traffic has already been programmed into the hardware-based L2 forwarding table 434 of the port interface, then the output VLAN ID and output port information can be obtained at the port interface by searching the hardware-based L2 forwarding table. Searching the hardware-based forwarding table is a relatively fast operation that involves using the input VLAN ID as criteria to identify the memory location of the desired table entry and obtaining the translated VLAN ID (the output VLAN ID) and the output port information from the table entry. In an embodiment, the hardware-based forwarding table is searched by hashing into the hardware-based L2 forwarding table using the input VLAN ID and the destination MAC address as criteria to identify the location in memory of the desired table entry. Once the desired table entry is identified, the translated VLAN ID that is stored as part of the table entry is attached to the traffic and the traffic is forwarded to the identified output port(s).” (Paragraph 0059 - emphasis added)

“If the VLAN ID translation rule for the respective traffic has not already been programmed into the hardware-based L2 forwarding table 434, then searching the hardware-based L2 forwarding table will result in an “L2 miss.” L2 misses occur when the forwarding rules related to traffic have not been learned before the traffic arrives at the port interface. In the case of an L2 miss, a hardware-based forwarding decision cannot be made for the respective traffic at the port interface. In response to an L2 miss, the L2 forwarding engine 432 refers to the L2 learning engine 436 to determine how to forward the traffic. With respect to VLAN traffic, the L2 learning engine will search the software-based L2 table for a corresponding table entry. If a corresponding table entry is located, then the forwarding information is provided to the L2 forwarding engine and the L2 forwarding engine attaches the translated VLAN ID to the traffic and forwards the traffic to the output port that is identified in

the table entry. In an embodiment, the table entry found in the software-based forwarding table is programmed into the hardware-based forwarding table so that forwarding decisions for subsequent traffic having the same VLAN ID can be made at the L2 processor 428 utilizing a hardware-based look-up." (Paragraph 0060 - emphasis added)

Applicant respectfully asserts that the excerpts relied upon by the Examiner merely teach that "the hardware-based forwarding table is searched by hashing into the hardware-based L2 forwarding table using the input VLAN ID and the destination MAC address as criteria to identify the location in memory of the desired table entry" and that "[o]nce the desired table entry is identified, the translated VLAN ID that is stored as part of the table entry is attached to the traffic and the traffic is forwarded to the identified output port(s)" (emphasis added).

Additionally, the excerpts teach that "[i]f the VLAN ID translation rule for the respective traffic has not already been programmed into the hardware-based L2 forwarding table 434, then searching the hardware-based L2 forwarding table will result in an "L2 miss" where "[i]n response to an L2 miss, the L2 forwarding engine 432 refers to the L2 learning engine 436 to determine how to forward the traffic" (emphasis added). Furthermore, the excerpts teach that "[w]ith respect to VLAN traffic, the L2 learning engine will search the software-based L2 table for a corresponding table entry" and that "[i]f a corresponding table entry is located, then the forwarding information is provided to the L2 forwarding engine and the L2 forwarding engine attaches the translated VLAN ID to the traffic and forwards the traffic to the output port that is identified in the table entry" (emphasis added). Still yet, the excerpts teach that "the table entry found in the software-based forwarding table is programmed into the hardware-based forwarding table" (emphasis added).

However, the excerpts fail to even suggest that "when in the second mode...splitting the first type lookup into a first level and a second level;...using the second lookup table for the first level; and...using the first lookup table for the second level" (emphasis added), as claimed by applicant. Clearly, disclosing that the L2 learning engine will search the software-based L2 table for a corresponding table entry in response

to an L2 miss from searching the hardware-based L2 forwarding table, fails to even suggest “splitting the first type lookup into a first level and a second level” or “using the second lookup table for the first level; and...using the first lookup table for the second level” (emphasis added), as claimed by applicant, especially considering that applicant claims such technique “when in the second mode,” in the context claimed.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir.1991).

Applicant respectfully asserts that at least the third element of the *prima facie* case of obviousness has not been met, since the excerpts from the prior art references, as relied upon by the Examiner, fail to teach or suggest all of the claim limitations, as noted above. Nevertheless, despite such paramount deficiencies and in the spirit of expediting the prosecution of the present application, applicant has amended independent Claim 1 to further distinguish applicant’s claim language from the prior art excerpts relied on by the Examiner, as follows:

“in a second mode, the second controller configures the second lookup table for the first type lookup, and splits the first type lookup into a first level and a second level for using the second lookup table for the first level and using the first lookup table for the second level” (emphasis added).

For at least substantially the same reasons are argued above with respect to independent Claims 9 and 18, applicant respectfully asserts that the excerpts from

Hawthorne III do not disclose “splitt[ing] the first type lookup into a first level and a second level for using the second lookup table for the first level and using the first lookup table for the second level” (emphasis added), as claimed by applicant.

Thus, a notice of allowance or specific prior art showing of each of the foregoing claim elements, in combination with the remaining claimed features, is respectfully requested.

Applicant further notes that the prior art is also deficient with respect to the dependent claims. For example, with respect to Claim 7, the Examiner has relied on Paragraphs 0059 and 0060 from Hawthorne III to make a prior art showing of applicant’s claimed technique “wherein...the second level in the first lookup table is configured...to be performed if a miss indication from the first level in the second lookup table; and...to not be performed if a hit indication from the first level in the second lookup table.”

Applicant respectfully asserts that the excerpts relied upon by the Examiner merely teach that “the hardware-based forwarding table is searched by hashing into the hardware-based L2 forwarding table using the input VLAN ID and the destination MAC address as criteria to identify the location in memory of the desired table entry” and that “[o]nce the desired table entry is identified, the translated VLAN ID that is stored as part of the table entry is attached to the traffic and the traffic is forwarded to the identified output port(s)” (Paragraph 0059 - emphasis added).

Additionally, the excerpts teach that “[i]f the VLAN ID translation rule for the respective traffic has not already been programmed into the hardware-based L2 forwarding table 434, then searching the hardware-based L2 forwarding table will result in an “L2 miss” where “[i]n response to an L2 miss, the L2 forwarding engine 432 refers to the L2 learning engine 436 to determine how to forward the traffic” (Paragraph 0060 - emphasis added). Furthermore, the excerpts teach that “[w]ith respect to VLAN traffic, the L2 learning engine will search the software-based L2 table for a corresponding table entry” and “[i]f a corresponding table entry is located, then the forwarding information is

provided to the L2 forwarding engine and the L2 forwarding engine attaches the translated VLAN ID to the traffic and forwards the traffic to the output port that is identified in the table entry” (Paragraph 0060 - emphasis added). Still yet, the excerpts teach that “the table entry found in the software-based forwarding table is programmed into the hardware-based forwarding table” (Paragraph 0060 - emphasis added).

However, the excerpts fail to even suggest “[a] second level in the first lookup table is configured...to be performed if a miss indication from the first level in the second lookup table; and...to not be performed if a hit indication from the first level in the second lookup table” (emphasis added), as claimed by applicant. Clearly, disclosing that the L2 learning engine will search the software-based L2 table for a corresponding table entry in response to an L2 miss from searching the hardware-based L2 forwarding table, fails to even suggest “[a] second level in the first lookup table is configured...to be performed if a miss indication from the first level in the second lookup table” and that “the second level in the first lookup table is configured...not be performed if a hit indication from the first level in the second lookup table” (emphasis added), as claimed by applicant.

Additionally, with respect to Claim 16, the Examiner has relied on Paragraph 0060 from Hawthorne III to make a prior art showing of applicant’s claimed technique “wherein...the splitting the first type lookup into the first level and the second level includes configuring for a serial operation.”

Applicant respectfully asserts that the excerpt relied upon by the Examiner merely teaches that “[i]f the VLAN ID translation rule for the respective traffic has not already been programmed into the hardware-based L2 forwarding table 434, then searching the hardware-based L2 forwarding table will result in an “L2 miss” where “[i]n response to an L2 miss, the L2 forwarding engine 432 refers to the L2 learning engine 436 to determine how to forward the traffic” (emphasis added). Furthermore, the excerpt teaches that “[w]ith respect to VLAN traffic, the L2 learning engine will search the software-based L2 table for a corresponding table entry” and “[i]f a corresponding table

entry is located, then the forwarding information is provided to the L2 forwarding engine and the L2 forwarding engine attaches the translated VLAN ID to the traffic and forwards the traffic to the output port that is identified in the table entry” (emphasis added). Still yet, the excerpts teach that “the table entry found in the software-based forwarding table is programmed into the hardware-based forwarding table” (Paragraph 0060 - emphasis added).

However, the excerpts fails to even suggest “splitting the first type lookup into the first level and the second level includes configuring for a serial operation” (emphasis added), as claimed by applicant. Clearly, disclosing that the L2 learning engine will search the software-based L2 table for a corresponding table entry in response to an L2 miss from searching the hardware-based L2 forwarding table, fails to even suggest that “splitting the first type lookup into the first level and the second level includes configuring for a serial operation” (emphasis added), as claimed by applicant.

Again, applicant respectfully asserts that at least the third element of the *prima facie* case of obviousness has not been met, since the prior art references, as relied upon by the Examiner, fail to teach or suggest all of the claim limitations, as noted above.

Thus, a notice of allowance or specific prior art showing of each of the foregoing claim elements, in combination with the remaining claimed features, is respectfully requested.

Still yet, applicant brings to the Examiner’s attention the subject matter of new Claims 21-22 below, which are added for full consideration:

"wherein, in the second mode, a hash table is used for a split lookup" (see Claim 21); and

"wherein the second level is indexed by the hash table" (see Claim 22).

Again, a notice of allowance or a proper prior art showing of all of applicant's claim limitations, in combination with the remaining claim elements, is respectfully requested.

Thus, all of the independent claims are deemed allowable. Moreover, the remaining dependent claims are further deemed allowable, in view of their dependence on such independent claims.

In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 505-5100. The Commissioner is authorized to charge any additional fees or credit any overpayment to Deposit Account No. 50-1351 (Order No. RMI1P014).

Respectfully submitted,
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